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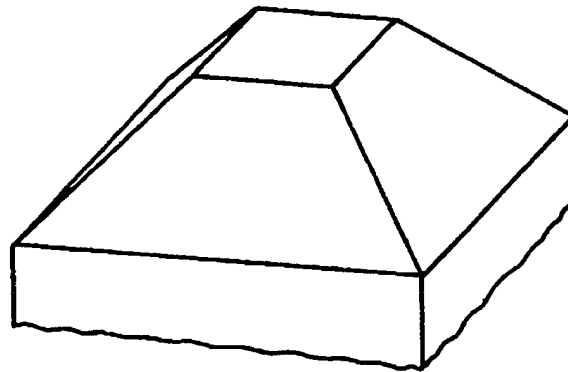
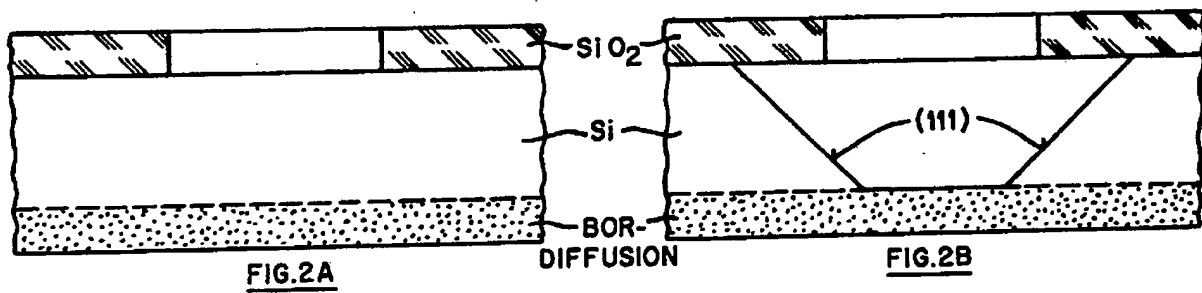
DISCLOSURE TEXT:

2p. Since the required sapphire styli cannot be produced by mechanical processes, the following method is employed for the series production of monocrystalline, pyramidal sapphire styli with a square (Fig. 1) or a rectangular cross section, microsharp edges (roughness < 1 μm), and an apical angle of about 60 degrees. Initially, a negative die is produced for the sapphire styli to be manufactured. - Thermal oxide (SiO_2) is grown on both sides of a bilaterally polished, n-type, (001) crystal oriented silicon wafer. The SiO_2 is subsequently removed on the bottom side by buffered hydrofluoric acid. The bare silicon boron is diffused to provide a surface concentration of 10/20/ at/cm/3/. The depth of penetration is about 5 μm . By photolithography, rectangular windows, whose edges lie exactly in the <110> directions within the (001) surface (Fig. 2a), are etched into the thermally grown oxide on the top side of the wafer. - The wafer is anisotropically etched in a solution of ethylene diamine, pyrocatechol, and water. The bottom area is confined by the boron diffusion, whereas the side walls of the etching pit are exactly identical to the four crystallographic (111) surfaces (Fig. 2b). For crystallographic reasons, the angle between the facing sidewalls is 70.5 degrees. The wafer thus treated is used as a negative die for the production of the sapphire styli. - After the SiO_2 mask has been removed by etching, sapphire is epitaxially grown on the die (Fig. 2c), for example, to the reaction; $2\text{AlCl}_3 + 3\text{H}_2 + 3\text{CO} \rightarrow \text{Al}_2\text{O}_3 + 3\text{CO} + 6\text{HCl}$ The initial monocrystalline growth of the sapphire is followed by polycrystalline growth to shorten the total growth time. - The silicon is removed from the sapphire styli array, for example by evaporation, or by contact with a 900 degrees C Cu plate, after formation of a Cu-Si eutectic. - Fig. 2d shows the sapphire plate thus produced which is subsequently cut into the various styli required.

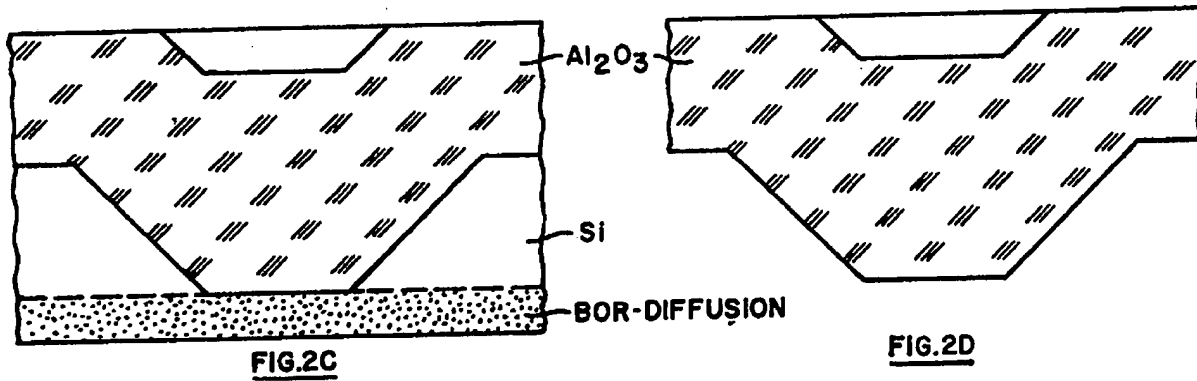
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FIG. 1FIG. 2A

BOR-DIFFUSION

FIG. 2BFIG. 2C

BOR-DIFFUSION

FIG. 2D